

IN THE CLAIMS:

Please AMEND claims 4 and 10 and ADD new claim 13 in accordance with the following:

1. (PREVIOUSLY PRESENTED) A joint structure of a robot, comprising:

a speed reducer;

a first member;

a second member connected to the first member through the speed reducer to rotate relative to the first member; and

a motor having a shaft, the motor to drive the second member to rotate relative to the first member, wherein

the speed reducer includes a first-stage speed reducing mechanism and a second-stage speed reducing mechanism,

the first-stage speed reducing mechanism includes an input gear connected directly to the shaft of the motor and spaced from a center of rotation of the speed reducer, a single spur gear in mesh with the input gear,

the second-stage speed reducing mechanism includes a crankshaft connected directly to the spur gear, an external gear which engages the crankshaft to be rocked eccentrically, a casing of the speed reducer, an internal gear which is formed inside the casing and is in mesh with the external gear, and a rotating member which supports the crankshaft for rotation and can rotate around the central axis of the internal gear with respect to the casing,

the casing of the second-stage speed reducing mechanism is attached to the first member,

the second member is attached to the rotating member of the second-stage speed reducing mechanism, and

the motor is attached to the second member, with the shaft of the motor shifted with respect to a center of rotation of the rotating member of the speed reducer, so that the input gear of the motor is in mesh with the spur gear of the first-stage speed reducing mechanism,

the rotating member defining a through hole passing therethrough, the center of rotation of the rotating member being within the through hole.

2. (PREVIOUSLY PRESENTED) The joint structure of a robot according to claim 1, wherein said second member comprises a mounting portion to mount the motor in a given position and is attached to the rotating member axis of the output of the speed reducer, and said second member and said rotating member are configured such that the rotational phase of the second member are configured such that the rotational phase of the second member with respect to the rotating member is settled using a positioning pin when attaching the second member to the rotating member.

3. (PREVIOUSLY PRESENTED) The joint structure of a robot according to claim 1, further comprising wiring or piping, wherein said first and second members of the robot have a hollow structure inside, and said casing defines a through hole passing therethrough and has a common axis with the through hole of the rotating member so that the wiring or piping is secured inside the joint.

4. (CURRENTLY AMENDED) A joint structure of a robot, comprising:
a speed reducer comprising:
a cylindrical casing,
a rotating member rotatably supported on the casing through a first bearing and having a hollow in the center thereof, and

a gear speed reducing mechanism arranged on the casing for rotation through a second bearing and having a hollow in the center thereof;

a first member fixed to the casing of the speed reducer and having a ~~hollow~~through hole in the center thereof;

a second member fixed to the rotating member of the speed reducer and having a ~~hollow~~through hole in the center thereof; and

a motor fixed to the second member so that the output shaft thereof extends in the direction parallel to the central axis of the speed reducer toward the gear speed reducing mechanism of the speed reducer, the motor having a shaft which is shifted with respect to a center of rotation of the rotating member of the speed reducer, and the center of rotation of the rotating member being within the ~~hollow~~through hole of the second member;

wherein a robot joint is constituted between the first member and the second member in a manner such that the gear speed reducing mechanism of the speed reducer is actuated by the rotation of the output shaft of the motor to make the second member rock with respect to the first member by rotating in a forward direction and a reverse direction.

5. (CURRENTLY AMENDED) A joint structure of a robot, comprising:

a speed reducer comprising a rotating member, a single spur gear, an input gear to drive the spur gear, and a crank shaft attached to the spur gear and spaced with respect to a center of rotation of the rotating member of the speed reducer;

a first member;

a second member connected to the first member through the speed reducer to rotate relative to the first member; and

a motor having a shaft to drive the input gear connected to the second member to drive the second member,

the rotating member defining a through hole passing therethrough, the center of rotation of the rotating member being within the through hole.

6. (PREVIOUSLY PRESENTED) The joint structure of a robot according to claim 5, wherein the input gear meshes with the spur gear and is connected to the shaft of the motor.

7. (PREVIOUSLY PRESENTED) The joint structure of a robot according to claim 6, wherein the speed reducer further comprises:
a casing attached to the first member.

8. (PREVIOUSLY PRESENTED) The joint structure of a robot according to claim 7, further comprising wiring or piping, wherein the casing defines a through hole passing therethrough and having a common axis with the through hole of the rotating member, and the wiring or piping passes through the through holes.

9. (PREVIOUSLY PRESENTED) The joint structure of a robot according to claim 8, wherein the motor is connected eccentrically to the second member to allow the wiring or piping to pass through the through holes.

10. (CURRENTLY AMENDED) The joint structure of a robot according to claim 5, wherein the crank shaft rotates around a first axis ~~does not revolve around and~~ the input gear rotates around a second axis different from the first axis.

11. (PREVIOUSLY PRESENTED) The joint structure of a robot according to claim 5, wherein the crank shaft is spaced inward in a radial direction of the joint structure with respect to the motor shaft.

12. (PREVIOUSLY PRESENTED) The joint structure of a robot according to claim 1, wherein the second member supports the crankshaft.

13. (NEW) The joint structure of a robot according to claim 4, wherein the second member is directly fixed to the rotating member.